# UNITED STATES PATENT AND TRADEMARK OFFICE

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JOHN A. SMART
708 BLOSSOM HILL RD., #201
LOS GATOS, CA 95032-3503

| EXAMINER |
|---|
| AHMED, HAMDY S |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on _2/29 07_.

2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) _1-45_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-45_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on _06 July 2004_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a) ☐ All   b) ☐ Some * c) ☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

Claims 1-45 are pending.

Claims 22 and 23 are withdrawn form the objection.

Claim 23 is withdrawn from USC 101 rejection.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-26 and 28-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Alsup (US No: 20040103251 A1) in view of Darcy (US No: 7,124,249 B1).

As to claim 1 Alsup reference teaches a method for extended memory (the memory is extended

by having more then one cache, see abstract lines 5-7) support in a database system (see figure 3, data

B1, data B2, and data B3) having a primary cache for storing data base page (see L1 cache, paragraph

5, line 2); when the primary cache is full, replacing database pages from the primary cache using the

secondary cache (see paragraph 6, if a miss occurs in the L1...,lines 5-8, and paragraph 44, lines 2-6); in

response to a request for a particular database page, searching for the database particular page in the

secondary cache if the particular database page is not found in the primary cache (see paragraph 6, lines

3-6), and swapping the particular database page found in the secondary cache with a database page in

the primary cache, so as to replace a database page in the primary cache with the particular database

page from the secondary cache (see paragraph 6, lines 11-15). The Alsup reference does not teach:

using a memory mapped file, creating a secondary cache in system memory available to the database

system; mapping a virtual address range to at least a portion of the secondary cache if the particular

database page is found in the secondary cache, determining a virtual address in the secondary cache

where the particular database page resides based on the mapping. The Darcy reference teaches using a

memory mapped file, creating a secondary cache in stem memory available to the database system (see

column 5, lines 9-16); mapping a virtual address range to at least a portion of the secondary cache if the

particular database page is found in the secondary cache (see column 5, lines 22-32), determining a

virtual address in the secondary cache where the particular database page resides based on the mapping

(see column 5, lines 17-32). Therefore, it would have been obvious at the time the invention was made to

a person having ordinary skill in the art to which said subject matter pertains to have modified the Alsup

system by using the Darcy system reference to create a software cache, because the implementation of

software cache is not limited to one aspect, but it can be used in numerous of others applications, for

sharing a volume of storage in a distributed manner. The software cache also, is programmed to operate

like a set associative hardware cache to allow efficient access to block of data in the cache (see column

28, lines 60-67, and column 29, lines 1-10).

As to claim 2 Alsup discloses  wherein said creating step includes creating the secondary cache.

The Darcy reference teaches wherein said creating step includes creating the secondary cache (see

figure1, L2, which communicates with L1 data cache  101 B and another shared memory file.

As to claim 3, Alsup discloses wherein the shared memory file system is available as part of an

operating system on a computer platform on which the database system is running (see figure 2, system

memory communicates with the data base, as part of operating system.

As to claim 5, The Alsup  wherein said mapping step includes using a memory mapped file

function. The Darcy reference teaches (see paragraph 21, line 10).

As to claim 6, Alsup discloses wherein the memory mapped file function is available as part of an

operating system on a computer platform on which the database system is running (see figure 2).

As to claim 7 Alsup discloses wherein said creating step includes creating the secondary cache

on external memory available to the database system (see (see figure 2, L2 is avalible to data B1 to data

B3).

As to claim 8 Alsup discloses wherein said swapping step includes consulting a least recently

used (LRU) list maintained for the primary cache to determine the database page to be moved to the

secondary cache (see paragraph 6, lines 8-15).

As to claim 9, Alsup discloses wherein said swapping step further comprises copying the database page to be moved to the secondary cache to a temporary buffer (each cache has temporary buffer to store database page see paragraph 38, lines 1-4).

As to claim 10 Alsup discloses wherein said swapping step further comprises moving the particular database page from the secondary cache to address of the database page in the primary cache to be moved to the secondary cache (see paragraph 6, lines 8-15) .

As to claim 11 wherein said swapping step further comprises moving the database page from the temporary buffer to the secondary cache each cache has temporary buffer to store database page (see paragraph 38, lines 1-4).

As to claim 12, Alsup discloses wherein further comprising: adding the replaced database page to a most recently used end of a most recently used/least recently used (MRU/LRU) list maintained for the secondary cache (this is a normal transfer between the firs cache and the second cache).

As to claim 13 Alsup discloses wherein said replacing step includes maintaining a least recently used (LRU) list for the primary cache and selecting the database page to be moved to the secondary cache based on said LRU list (this is a normal transfer between the firs cache and the second cache)..

As to claim 14 Alsup discloses further comprising: providing a washing mechanism in the secondary cache for writing database pages in the secondary cache to disk (see paragraph 28, lines 10-12).

As to claim15, Alsup discloses wherein a database page is written from the secondary cache to disk in response to copying a database page from disk to the primary cache (see paragraph 6, lines8-15).

As to claim 16, Alsup discloses wherein the database page written from the secondary cache to disk is selected, based at least in part, on a most recently used/least recently used (MRU/LRU) list maintained for the secondary cache(see paragraph 48, lines 1-5).

As to claim 17, Alsup discloses wherein said replacing step includes determining database pages to be maintained in the secondary cache (see paragraph 5, lines 12-14).

As to claim 18 Alsup discloses wherein said determining step includes determining database

pages to be maintained in the secondary cache based, at least in part, on workload of the database

system (see figure 2, where the address is maintained between L2 and database).

As to claim 19, wherein said replacing step includes sub steps of: moving a database page from

the primary cache to the secondary cache; and reading a database page into the primary cache from disk

(if a miss occurs in the L1, lines 5-8, and paragraph 44, lines 2-6).

As to claim 20 Alsup discloses wherein said sub step of moving a database page from the

primary cache includes selecting a database page from the primary cache based on a least recently used

(LRU) list maintained for the primary (see paragraph 48, lines1-12).

As to claim 21 Alsup discloses wherein said sub step of moving a database page from the

primary cache includes selecting a location for the database page in the secondary cache based on a

most recently used/least recently used (MRU/LRU) list maintained for the secondary cache (see

paragraph 48, lines1-12).

As to claim 22, Alsup discloses further comprising: storing on a computer-readable medium processor-

executable instructions for performing the method of claim 1 (see figure 1).

As to claim 23, Alsup discloses further comprising: down loading a set of processor-executable

instructions for performing the method of claim 1 (see figure 3).

As to claim 24, Alsup discloses database system providing extended memory support, the system

comprising: a primary cache (see L1 cache, paragraph 5, line2) for maintaining data pages used by the

database (see figure 2, L2 is available to data B1 – B3) system in addressable memory available to the

database system; a secondary cache (see L2 cache, paragraph 5, line1), created in system memory

using a memory mapped file, for maintaining data pages replaced from the primary cache (see paragraph

47, lines 4- 7) in extended memory available to the database system; a search module for receiving a

request from a user for a particular data page and determining whether the particular data page is in

secondary cache if the particular data page is not in the primary cache; and a module for replacing a data

page in the primary cache with the particular data page from the secondary cache if the particular data

page is found in the secondary cache (see paragraph 47, lines 4-10).

As to claim 25, Alsup discloses wherein the secondary cache is implemented using a shared

memory file system (the secondary cache communicates with the primary cache and the memory system, which constitutes a shared memory system, see figure 3).

As to claim 26, the Alsup reference teaches wherein the shared memory file system is available as part of an operating system on a computer platform on which the database system is running (see figure 2, where the shared memory file system communicates with the database system (data B0 – B3) on a common computer platform).

As to claim 28, Alsup discloses wherein the secondary cache is mapped to the extended memory using a memory mapped file function (the memory is extended by having more than one cache see figure 2,L2 is communicates with system memory)

As to claim 29, Alsup discloses wherein the memory mapped file function is available as part of an operating system on a computer platform on which the database system is running (see figure 2, system memory communicates with the database as part of one operating system).

As to claim 30,  Alsup discloses wherein the secondary cache is created on external memory available to the database system(see figure 2, L2  communicates with system memory).

AS to claim 31, Alsup discloses wherein the primary cache includes a least recently used (LRU) list for determining data pages to be more to the secondary cache (this is normal operation see paragraph 48, lines 1-12

AS to claim 32, Alsup discloses wherein the module for replacing consults the LRU list for selecting the data page to be moved to the secondary cache (this is normal operation see paragraph 48, lines 1-12).

As to claim 33, Alsup discloses wherein the module for replacing copies the data page to be moved to the secondary cache to a temporary buffer (each cache has temporary buffer to store database page see paragraph 38, lines 1-4).

AS to claim 34, , Alsup discloses wherein the module for replacing moves the particular data page from the secondary cache to address of the data page in the primary cache to be moved to the secondary cache (see paragraph 47, lines 4-10).

As to claim 35, Alsup discloses wherein the module for replacing moves the data page from the

temporary buffer to the secondary cache (each cache has temporary buffer to store database page see

paragraph 38, lines 1-4)

As to claim 36, Alsup discloses wherein the secondary cache includes a most recently used/least recently

used (MRU/LRU) list and the module for replacing adds the data page moved to the secondary cache to

the most recently used end of said MRU/LRU list (see paragraph 47, lines 10-12).

As to claim 37, Alsup discloses further comprising: a washing mechanism in the secondary cache

for writing data pages in the secondary cache to disk (see paragraph 28, lines10-12).

AS to claim 38, Alsup discloses wherein the washing mechanism writes a data page in the

secondary cache to disk in response to copying a data page from disk to the primary cache (see L2 figure

2, to disk in response to copying a data page from disk to the primary cache (see figure 2, and paragraph

47, lines 6-9).

As to claim 39, Alsup discloses wherein the washing mechanism selects the data page from the

secondary cache based, at least in part, on a most recently used/least recently used (MRU/LRU) list

maintained for the secondary cache (see paragraph 47, lines 10-12).

As to claim 40, Alsup discloses wherein the module for replacing determines data pages to be

maintained in the secondary cache(see paragraph 6, lines 11-12).

As to claim 41, Alsup discloses further comprising: a module for reading a page into the primary

cache from disk (see paragraph 25 lines1-3).

As to claim 42, Alsup discloses wherein the module for reading selects a data page from the

primary cache to be moved to the secondary cache if the primary cache is full (see paragraph 7, lines 10-

13).

As to claim 43, Alsup discloses wherein the module for reading selects the data page based on a

least recently used (LRU) list maintained for the primary cache (see paragraph 48, lines 10-13).

As to claim 44, Alsup discloses wherein the module for reading selects a location in the

secondary cache for the data page to be moved from the primary cache (see paragraph 48, lines 10 –15).

As to claim 45 Alsup discloses wherein the module for reading selects the location in the

secondary cache based on a most recently used/least recently used (MRU/LRU) list maintained for the

secondary cache (see paragraph 48, lines 10-13)

Claims 4 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alsup (US No:

20040103251 A1) in view of Austin et al. (US No: 20030162544 A1).

## *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darcy (US No:

7,124,249 B1). in view of Austin et al. (US No: 20030162544 A1).

As to claim 4, Darcy reference teaches all the limitation of claim 1-3 as the above, but Darcy

reference does not teach, the use of a Linux operating system. The Austin reference teaches the use of a

Linux operating system (see paragraph 58 lines 1-10). Therefore, it would have been obvious at the time

the invention was made to a person having ordinary skill in the art to which said subject matter pertains to

have modified the Darcy system by using the Austin system reference by using a Linux operating

system, because is widely used as the operating system for a number of different applications.

Accordingly, the system can implement a wide variety of standard operating software for network servers

and the like, as well as allowing third parties the opportunity to modify existing software and develop their

own software.

As to claim 27, Darcy reference teaches all the limitation of claim 26,as the above, but Darcy

reference does not teach, the use of a Linux operating system. The Austin reference teaches the use of a

Linux operating system (see paragraph 58 lines 1-10). Therefore, it would have been obvious at the time

the invention was made to a person having ordinary skill in the art to which said subject matter pertains to

have modified the Darcy system by using the Austin system reference by using a Linux operating

system, because is widely used as the operating system for a number of different applications.

Accordingly, the system can implement a wide variety of standard operating software for network servers

and the like, as well as allowing third parties the opportunity to modify existing software and develop their

own software.

## *Response to Arguments*

Applicant's arguments with respect to claims 1-45 have been considered but are largely moot in

view of the new ground(s) of rejection.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should

be directed to Hamdy S. Ahmed whose telephone number is 571-270-1027. The examiner can normally

be reached on M-TR 7:30-5:00pm and Every 2nd Friday 7:30-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Hung Sough can be reached on 571-272-4199. The fax phone number for the organization where this

application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be obtained from

either Private PAIR or Public PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

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at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative

or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-

1000.

*H A*

Hamdy Ahmed

4/30/07

HYUNG SONGH

SUPERVISORY PATENT EXAMINER

4-30-07